Bacteria -> Spirochete -> Borrelia

*B. hermsii & B. duttonii*

* Relapsing fever (Endemic)
* Reservoir – soft tick
* Replicate in blood, neural tissue
* Lower fatality rate
* Treat with Tetracyclines
* Comp
  + Jarisch-Herxheimer Rxn

*Borrelia burgdorferi*

* Similar to Gm-, but don’t stain
* Contain endoflagella that propel bacteria in corkscrew motion
* Reservoir – Ticks
  + Ixodes scapularis
  + Ixodes pacificus
* NH – Mouse, Bird
* TH – Human

**Epidemiology**

* Most prevalent in young boys and elderly
* Most cases in Spring and Early Summer

**Virulence Factors**

* Lipoproteins
* Endoflagella
* Binds and inhibits host Factor H
* Does not require metabolic iron

**Lyme Disease: Early Disease – Stage 1**

* Erythema migrans (bulls-eye rash)
* Flu-like symptoms
  + Fatigue, malaise, fever, H/A

**Lyme Disease: Late Disease – Stage 2**

* Arthritis
  + Usually seen in one of larger joints
  + Subacute (Secondary)
    - Treatable
    - Spriochetes present
    - Driven by lipoproteins
  + Chronic (Inflamatory)
    - Treatment-resistant
    - Spirochetes not present
* Neurologic Complications
  + Bell’s palsy
* Cardiac Complications
  + AV block, Myocarditis, Palpitations
* Disseminated erythema migrans

**Diagnosis**

* ELISA, if positive, then
* Western blotting

**Prevention**

* Avoid tick habitat
* Wear protective clothing
* Survey for ticks

**Treatment**

* Doxycycline
* Amoxicillin
* Cefuroxime axetil
* IV antibiotics if serious

*B. recurrentis*

* Relapsing Fever (Epidemic)
* Reservoir – Body Lice
* Replicate in blood
* Higher fatality rate
* Treat with Tetracyclines
* Comp
  + Jarisch-Herxheimer Rxn

Bacteria -> Spirochete -> Leptospira

*L. interrogans*

* Shed in urine
* Enters thru skin or mucous membrane

**Leptospirosis: Initial Phase**

* Generalized “flu-like” symptoms

**Leptospirosis: Secondary Phase**

* Many forms depending on affected tissue
* Weil’s Disease/Syndrome
* Severe pulmonary hemorrhagic syndrome

**Diagnosis**

* Agglutination
* Culture on highly-enriched liquid/agar

**Treatment**

* Tetracyclines
* Β-lactams

Bacteria -> Spirochete -> Treponema

* Virtually no protein on surface. If so, they are called TROMPs

**Primary Syphilis**

* Local infection
* Vaginal chancres
* Painless ulcers with heaped up edges

**Secondary Syphilis**

* Disseminated via blood
* Fever, mailaise, arthralgia, arthritis
* Rash on palms and soles
* Condyloma Latum (eruptions on skin)
* Hepatosplenomegaly

**Tertiary Syphilis**

* Severe consequences
* Granulomatous lesions called “gummas” in skin, bones, and liver
* Neurosyphilis
  + General paresis -> dementia & paralysis
  + Tabes Dorsalis
* Cardiovascular syphilis
  + Aneurysm
  + Aortic Valve Insufficiency

**Diagnosis**

* VDRL, RPR, TRUST
  + Flocculation tests that aren’t specific
* FTA, TPHA, TPPA
  + Specific tests to confirm T. pallidum

**Treatment**

* No Vaccine
* 1 dose of Penicillin

Congenital Syphilis

* Occure is mother is infected with syphilis late in the pregnancy
* Bone/Tooth Deformation
* Heart & Brain damage
* Results in 1/5 chance of stillbirth
* Results in 1/5 chance of neonatal death

**Treatment**

* No infection in first 10 weeks of pregnancy so can treat then